

Please type a plus sign (+) inside this box → +

PTO/SB/08a (08-03)

Approved for use through 07/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substitute for form 1449A/PTO

**SUPPLEMENTAL INFORMATION
DISCLOSURE STATEMENT OF
APPLICANT**

(Use as many sheets as necessary)

Sheet 1

of 1

Application Number	10/634,662
Filing Date	August 4, 2003
First Named Inventor	Chang, et al.
Group Art Unit	1762
Examiner Name	Wesley D. Markham
Attorney Docket Number	APPM/005975.P1/CPI/COPPER/LB/PJS
Submission Date	October , 2005

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
KMS	A1	US 6790773	09/14/2004	Drewery, et al.	
KMS	A2	US 20050081882	04/21/2005	Greer, et al.	
KMS	A3	US-20050006799	01/13/2005	Gregg, et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
KMS	B1	WO 2005/020317	03/03/2005	Chang, et al.		
KMS	B2	EP 1 293 509	09/10/2002	Kawano, et al.		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
KMS	C1	International Search Report dated July 29, 2005 regarding International Application No. PCT/US2005/010203 (APPM/005975PC03)	
KMS	C2	Meda, et al. "Chemical Vapor Deposition of Ruthenium Dioxide Thin Films From Bis(2, 4-dimethylpentadienyl) Ruthenium," Chemical Aspects of Electronic Ceramics Processing, Symposium Mater. Res. Soc., Warrendale, PA, USA, 1998, pp. 75-80, XP009050315, ISBN: 1-55899-400-9	

Examiner /Kelly Stouffer/

Date Considered 09/20/2006

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

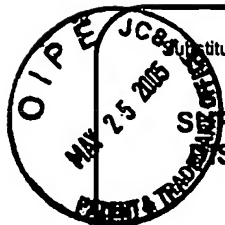
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Please type a plus sign (+) inside this box → +

PTO/SB/08a (08-03)

Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



Substitute for form 1449A/PTO

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1

of 1

Application Number	10/634,662
Filing Date	August 4, 2003
First Named Inventor	Chang, et al.
Group Art Unit	1762
Examiner Name	Wesley D. Markham
Attorney Docket Number	AMAT/5975.P1/CPI/COPPER/LB/PJS
Submission Date	May 23, 2005

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number Number-Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KMS	A1	US-6887795	05/03/2005	SOININEN, ET AL.	
	A2	US-6800937	10/05/2004	MARSH, ET AL.	
	A3	US-6800542	10/05/2004	KIM	
	A4	US-6780758	08/24/2004	DERDERIAN, ET AL.	
	A5	US-6744138	06/01/2004	MARSH	
	A6	US-6743739	06/01/2004	SHIMAMOTO, ET AL.	
	A7	US-6737317	05/18/2004	MARSH, ET AL.	
	A8	US-6627995	09/30/2003	PARANJPE, ET AL.	
	A9	US-6596602	03/25/2003	RUESCHER, ET AL.	
	A10	US-6576778	06/10/2003	UHLENBROCK, ET AL.	
	A11	US-6541067	04/01/2003	MARSH, ET AL.	
	A12	US-6517616	02/11/2003	MARSH, ET AL.	
	A13	US-6338991	01/15/2002	ZHANG, ET AL.	
	A14	US-6114557	09/05/2000	UHLENBROCK, ET AL.	
	A15	US-20040241321	12/02/2004	GANGULI, ET AL.	
	A16	US-20040105934	06/03/2004	CHANG, ET AL.	
	A17	US-20040038529	02/26/2004	SOININEN, ET AL.	
	A18	US-20040005753	01/08/2004	KOSTAMO, ET AL.	
	A19	US-20030212285	11/13/2003	UHLENBROCK, ET AL.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
KMS	B1	WO 03/056612	07/10/2003	GENITECH CO., LTD.		

NON PATENT LITERATURE DOCUMENTS

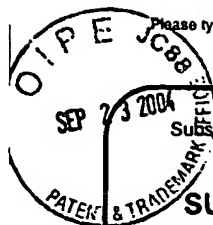
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
KMS	C1	International Search Report dated March 11, 2005 regarding International Application No. PCT/US2004/024805 (AMAT/5975PC02PCT)	

Examiner /Kelly Stouffer/

Date Considered 09/20/2006

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * Applicant's unique citation designation number (optional). † See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 801.04. ‡ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ‡ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ‡ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ‡ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.



Please type a plus sign (+) inside this box → ☐

PTO/SB/08a (08-03)
Approved for use through 07/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substitute for form 1449A/PTO

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1

of 1

Application Number	10/634,662
Filing Date	August 4, 2003
First Named Inventor	Chang, et al.
Group Art Unit	1762
Examiner Name	Unknown
Attorney Docket Number	AMAT/5975.P1/CPI/COPPER/LB/PJS
Submission Date	September 20, 2004

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
KMS	A1	US-6,713,373 B1	03/30/2004	Omstead	
↓	A2	US-6,605,735 B2	08/12/2003	Kawano, et al.	
	A3	US-6,479,100 B2	11/12/2002	Jin, et al.	
	A4	US-6,440,495 B1	08/27/2002	Wade, et al.	
↓	A5	US-2002/0173054 A1	11/21/2002	Kim	
	A6	US-2001/0006838 A1	07/05/2001	Won, et al.	

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
KMS	C1	Aaltonen, et al., "Atomic Layer Deposition of Ruthenium from RuCp ₂ and Oxygen: Film Growth and Reaction Mechanism Studies," Electrochemical Society Proceedings Volume 2003-08 pp. 946-953.	
↓	C2	Aaltonen, et al., "Atomic Layer Deposition of Ruthenium Thin Films from Ru(thd) ₃ and Oxygen," Chem. Vap. Deposition (2004), 10, No. 4 pp. 215-219.	
	C3	Aaltonen, et al., "Ruthenium Thin Films Grown by Atomic Layer Deposition," Chem. Vap. Deposition (2003), 9, No.1 pp.45-49.	
	C4	Aoyama, et al., "Ruthenium Films Prepared by Liquid Source Chemical Vapor Deposition Using Bis-(ethylcyclopentadienyl)ruthenium," Jpn. J. Appl. Phys. Vol. 38 (1999) pp. L1134-L1136.	
	C5	Dadgar, et al., "Growth of Ru doped semi-insulating InP by low pressure metalorganic chemical vapor deposition," Journal of Crystal Growth 195 (1998) pp. 69-73.	
	C6	Kwon, et al., "Atomic Layer Deposition of Ruthenium Thin Films for Copper Glue Layer," Journal of the Electrochemical Society, 151 (2) (2004) pp. G109-G112.	
	C7	Kwon, et al., "Plasma-Enhanced Atomic Layer Deposition of Ruthenium Thin Films," Electrochemical and Solid-State Letters, 7 (4) (2004) pp. C46-C48.	
	C8	Lashdaf, et al., "Deposition of palladium and ruthenium β-diketonates on alumina and silica supports in gas and liquid phase," Applied Catalysis A: General 241 (2003) pp. 51-63.	
↓	C9	Lim, et al., "Atomic layer deposition of transition metals," Nature Materials, Vol. 2 November (2003) pp. 749-754.	
	C10	Shibutami, et al., "A Novel Ruthenium Precursor for MOCVD without Seed Ruthenium Layer," TOSOH Research & Technology Review, Vol. 47 (2003) pp. 61-64.	

Examiner /Kelly Stouffer/

Date Considered 09/20/2006

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * Applicant's unique citation designation number (optional). * See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. * Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). * For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. * Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. * Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified)					Docket No. AMAT/5975.P1/CPI/ COPPER/BG		Serial No. 10/634,662	
LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT					Applicant Chang, et al.		Confirmation No.: Unknown	
(Use several sheets if necessary)					Filing Date		Group	
		Examiner	Unknown		August 4, 2003		Unknown	
U.S. Patent Documents								
*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date If Appropriate	
KMS	A1	6,617,634	09/09/03	Marsh, et al.	257	300	02/12/02	
	A2	6,610,568	08/26/03	Marsh, et al.	438	250	08/23/01	
	A3	6,597,029	07/22/03	Kim, et al.	257	295	06/14/01	
	A4	6,596,602	07/22/03	Iizuka, et al.	438	396	01/24/02	
	A5	6,580,111	06/17/03	Kim, et al.	257	301	05/23/01	
	A6	6,527,855	03/04/03	DelaRosa, et al.	117	89	10/10/01	
	A7	6,482,740	11/19/02	Soininen, et al.	438	686	05/15/01	
	A8	6,462,367	10/08/02	Marsh, et al.	257	295	06/25/01	
	A9	6,423,619	07/23/02	Grant, et al.	438	589	11/30/01	
	A10	6,372,598	04/16/02	Kang, et al.	438	399	06/16/99	
	A11	6,365,502	04/02/02	Paranjpe, et al.	438	622	03/03/00	
	A12	6,346,477	02/12/02	Kaloyeros, et al.	438	680	01/09/01	
	A13	6,203,613	03/20/01	Gates, et al.	117	104	10/19/99	
	A14	6,063,705	05/16/00	Vaartstra	438	681	08/27/98	
	A15	5,962,716	10/05/99	Uhlenbrock, et al.	556	16	08/27/98	
For Ign Patent Documents								
*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
KMS	B1	02/45167	06/06/02	WO	H01L	27/00	<input type="checkbox"/>	<input type="checkbox"/>
	B2	01/88972	11/22/01	WO	H01L	21/321	<input type="checkbox"/>	<input type="checkbox"/>
	B3	2001-237400	08/31/01	JP	H01L	27/108	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B4	2001-111000	04/20/01	JP	H01L	27/105	<input type="checkbox"/>	<input checked="" type="checkbox"/>
OTHER ART								
*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.						
	C1							
	C2							
	C3							
Examiner /Kelly Stouffer/					Date Considered 09/20/2006			
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.								

U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified)					Docket No. AMAT/5975.P1/CPI/ COPPER/BG		Serial No. 10/634,662	
LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT					Applicant Chang, et al.		Confirmation No.: Unknown	
(Use several sheets if necessary)					Filing Date		Group	
		Examiner	Unknown		August 4, 2003		Unknown	
U.S. Patent Documents								
*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date If Appropriate	
KMS	A1	5,372,849	12/13/94	McCormick, et al.	427	253	01/18/94	
	A2	2003/0165615	09/04/03	Aaltonen, et al.	427	79	01/29/02	
	A3	2003/0096468	05/22/03	Soininen, et al.	438	200	11/19/02	
	A4	2002/0125516	09/12/02	Marsh, et al.	257	295	02/12/02	
	A5	2002/0121697	09/05/02	Marsh	257	751	04/30/02	
	A6	2002/0102810	08/01/02	Iizuka, et al.	438	396	01/24/02	
	A7	2002/0081381	06/27/02	DelaRosa, et al.	427	255.28	10/10/01	
	A8	2002/0076881	06/20/02	Marsh, et al.	438	250	02/12/02	
	A9	2002/0076837	06/20/02	Hujanen, et al.	438	3	11/28/01	
	A10	2002/0074577	06/20/02	Marsh, et al.	257	250	02/12/02	
	A11	2002/0028556	03/07/02	Marsh, et al.	438	299	06/25/01	
	A12	2002/0025627	02/28/02	Marsh, et al.	438	250	08/23/01	
	A13	2002/0004293	01/10/02	Soininen, et al.	438	584	05/15/01	
	A14	2002/0000587	01/03/02	Kim, et al.	257	295	06/14/01	
	A15	2001/0054730	12/27/01	Kim, et al.	257	301	05/23/01	
For Ign Patent Documents								
*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
	B1						<input type="checkbox"/>	<input type="checkbox"/>
	B2						<input type="checkbox"/>	<input type="checkbox"/>
	B3						<input type="checkbox"/>	<input type="checkbox"/>
	B4						<input type="checkbox"/>	<input type="checkbox"/>
OTHER ART								
*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.						
	C1							
	C2							
	C3							
Examiner /Kelly Stouffer/					Date Considered 09/20/2006			
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.								